

- (A) to determine whether the liquid layer is a solution
(B) to determine whether the liquid layer could support life
(C) to determine the chemical composition of the liquid layer
(D) to determine whether the liquid layer is a homogeneous solution or heterogeneous mixture

10. A 10.00-g piece of metal is submerged in a graduated cylinder initially containing 20.00 mL of water. With the metal in the cylinder, the level of the water is recorded as 21.40 mL. Determine the identity of the metal.

- (A) aluminum (density = 2.70 g/mL)
(B) zinc (density = 7.13 g/mL)
(C) silver (density = 10.49 g/mL)
(D) gold (density = 19.32 g/mL)

Chap 1

CCABBA

BCDDDB

Friday

Please call the Public Works Office at 7
PICKUP if you have White Goods, i.e.

Why can we conclude that all of the water of hydration has been removed?

- (A) The mass of the crucible and sample increased then decreased.
- (B) The mass of the crucible and sample decreased after each heating.
- (C) The mass of the crucible and sample decreased due to the water of hydration being "driven off" by the heating.
- (D) The mass of the crucible and sample remained relatively

constant after the second heating.

What is the mass of the water of hydration in the hydrate?

(A) 3.4146 g

(B) 1.7402 g

(C) 2.4512 g

(D) 1.7402 g

Chap 2

ABADA

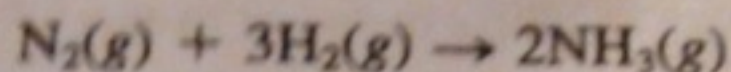
DCBCC

ADCB, B

What mass of water can be produced from 16 grams of meth-
ane and excess oxygen?

- (A) 8.0 g
- (B) 16 g
- (C) 18 g
- (D) 36 g

17. Which of the following reaction mixtures would produce the greatest amount of product, assuming all went to completion? Each involves the reaction symbolized by the equation:



- (A) 2 mol N_2 and 4 mol H_2
- (B) 1 mol N_2 and 5 mol H_2
- (C) 4 mol N_2 and 2 mol H_2
- (D) 5 mol N_2 and 1 mol H_2

Chap 3

C B D C C

A A B B C

D D B A D

D A

- (B) 1.40 M
(C) 1.60 M
(D) 2.00 M
15. What volume of 0.2000 M sulfuric acid is required to neutralize 800.0 mL of 0.1000 M potassium hydroxide?
- (A) 200.0 mL
(B) 400.0 mL
(C) 800.0 mL
(D) 1600. mL

Chap 4

C C B C D

A B B D A

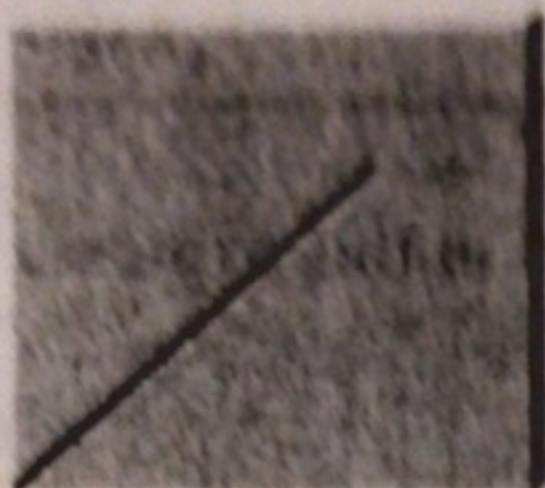
D A B C A

pressure, and the volume available for the gas particles is greater than the volume of the container.

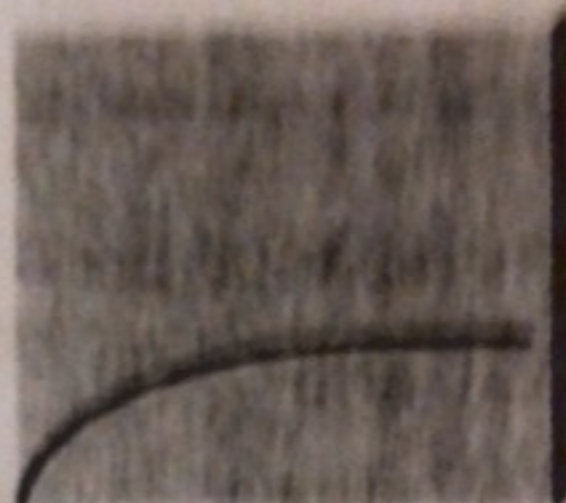
- (D) The observed pressure will be greater than the ideal pressure, and the volume available for the gas particles is less than the volume of the container.

Use the following information to answer questions 14–16:

(A)



(B)



(C)



(D)



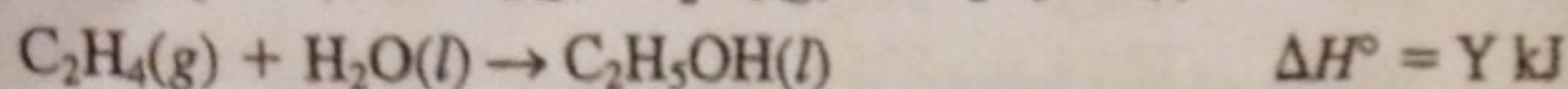
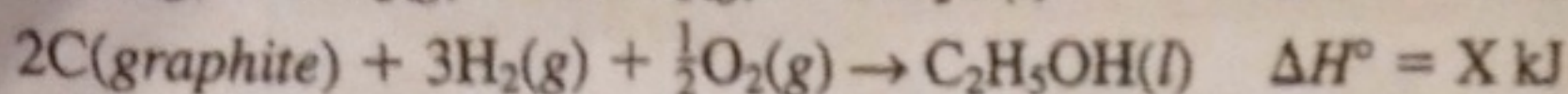
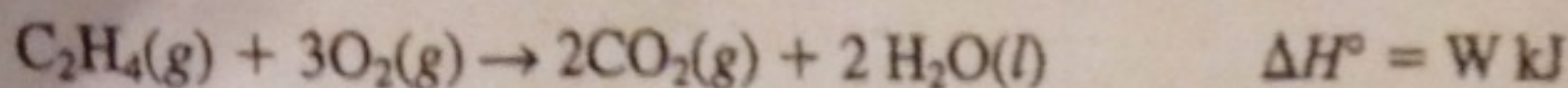
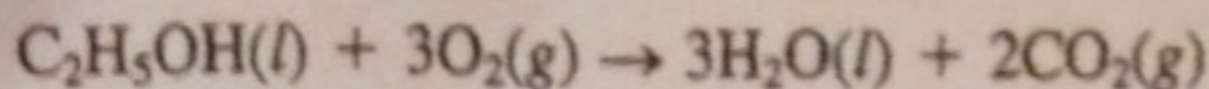
Chap 5

C D A B D

A B B C D

B C A C A , D

14. Using Hess's law and the equations below find ΔH° at 25°C for the oxidation of $\text{C}_2\text{H}_5\text{OH}(l)$.



- (A) $W - Y$
(B) $X - 2Y$
(C) $X + 2W + Y$
(D) $2X - W + Y$

15. A popular chemistry demonstration is to drop a piece of sodium metal into water. The products are sodium hydroxide and hydrogen gas. Determine ΔH_{rxn} for this reaction for 1.00 mole of hydrogen gas being produced, given

$$\Delta H_f^\circ[\text{H}_2\text{O}(l)] = -286 \text{ kJ/mol}$$

$$\Delta H_f^\circ[\text{NaOH}(aq)] = -470 \text{ kJ/mol}$$

- (A) -368 kJ
(B) -184 kJ

Chap 6

C A B B C

D B D D D

B C C A A

- (C) O^{2-} , O , O^+
 (D) O^{2-} , O , O^+
15. The table below shows the first eight ionization energies for four random elements from the second and third periods of the periodic table. Based on these data, which elements would most likely have similar chemical properties?

Ionization Energy (kJ/mol)	Element W	Element X	Element Y	Element Z
First	1,314	1,000	578	496
Second	3,388	2,252	1,817	4,562
Third	5,301	3,357	2,745	6,910
Fourth	7,469	4,556	11,577	9,543
Fifth	10,990	7,004	14,842	13,354
Sixth	13,327	8,496	18,379	16,613
Seventh	71,330	27,107	23,326	20,117
Eighth	84,078	31,719	27,465	25,496

- (A) W and X
 (B) W and Y
 (C) X and Z
 (D) Y and Z

Chap 7

CDDCB

BBBAC

ABCOA

Please call the Public Works Office at 783-3265, THE MONDAY
 PICKUP if you have White Goods, i.e. - stoves, refrigerators,
 water heater, etc.

an alkaline earth metal.
than the alkaline earth
NaF, NaCl, KBr, and CsI
 $\text{NaF} > \text{KBr} > \text{CsI}$
is this trend?
more energy to melt
results in smaller lat-
g points.
the atomic number
, the easier it is to
point.
nal to the electro-
ne compound;
in the chemical

15. Which of the following correctly ranks the following species from smallest to largest ionic radius?
- (A) Cl^- , S^{2-} , K^+ , Ca^{2+}
 - (B) K^+ , Ca^{2+} , Cl^- , S^{2-}
 - (C) S^{2-} , Cl^- , K^+ , Ca^{2+}
 - (D) Ca^{2+} , K^+ , Cl^- , S^{2-}

Chap 8

BBCDD

DGACA

ABBCD

weaker interparticle attractions, and have lower particle motion compared with a liquid.

(C) In a solid, particles are slightly closer together, have weaker interparticle attractions, and have greater particle motion compared with a liquid.

(D) In a solid, particles are slightly further apart, have weaker interparticle attractions, and have greater particle motion compared with a liquid.

21. Silicon dioxide, SiO_2 , is a covalent network solid with each silicon atom bonded to four oxygen atoms, forming a large network of SiO_4 tetrahedra of great strength. Which of these other compounds would you predict to have similar properties?

(A) MgO

(B) CO_2

(C) SO_2

(D) GeO_2

Chap 10

CBCAC

DABDD

BCABA

BCA D A D

	MAY
	7
	14
Monday	
Tuesday	
Thursday	
Friday	

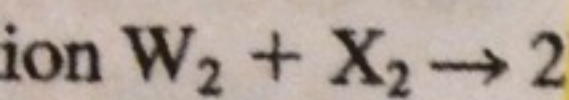
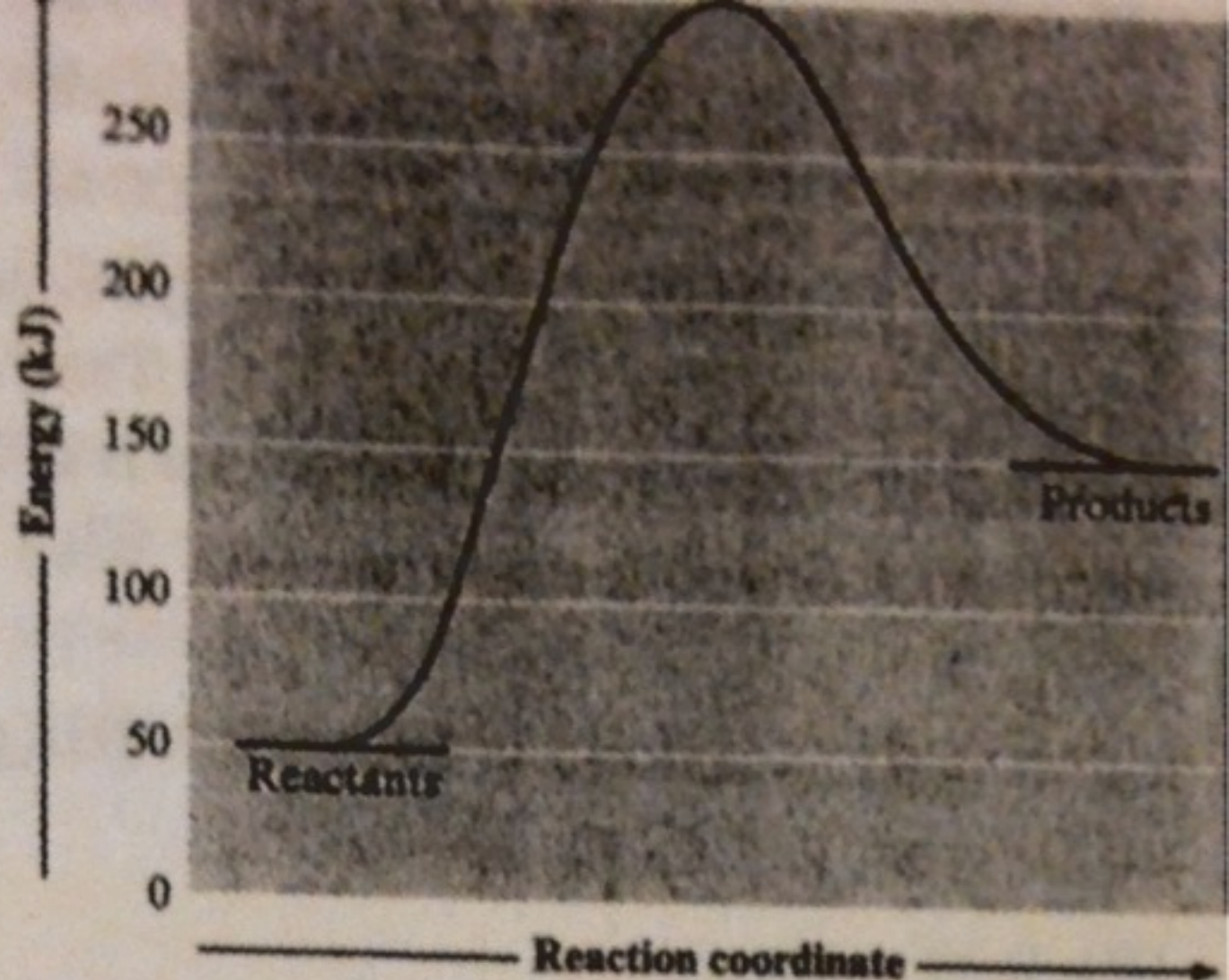
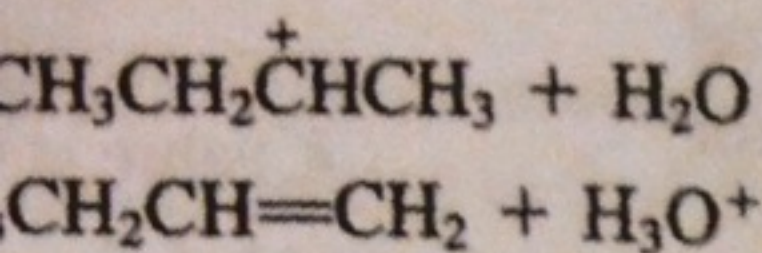
Chap 11

CBADA

BCCDD

	MAY
Monday	7
Tuesday	14

e two-step conversion of
e mechanism below, pro-
f an acid. What is the role



st)

mechanism?

(D) 300

Chap 12

OBCBC

ADBDD

CABAC

When the
dissociate the
increase signifi-
cantly:

step 1

step 2

step 3

rate-determining

p without

rate according
needed to find the
chlorate (molar
-L container at
decomposed

- (B) an increase in the concentration of SO_2 and a decrease in the temperature
- (C) an increase in the concentration of SO_3 and a decrease in the temperature
- (D) an increase in the concentration of SO_3 and an increase in the temperature

16. It is found that the value of the reaction quotient is 12 for a given reaction, whereas the equilibrium constant is 8.0. Which statement best describes how the system will respond?

- (A) Since $Q > K$, the forward reaction is favored and the equilibrium shifts to the right.
- (B) Since $Q < K$, the forward reaction is favored and the equilibrium shifts to the right.
- (C) Since $Q < K$, the reverse reaction is favored and the equilibrium shifts to the left.
- (D) Since $Q > K$, the reverse reaction is favored and the equilibrium shifts to the left.

Chap 13

ACBCD

BADAC

CBBDP D

MAY

7

WARRAGE DAY

Monday

Chap 14

B B A D A

A D C B B

C C D C

your pickup days

GARBAGE DAY

MAY

(D) Twice as much NaOH is needed.

Chap 15

B D B D D

A B C C C

A A C D D

10. Solid sodium fluoride, at 25°C, is stirred in pure water. Which is the correct statement?
(A) The solution becomes more acidic.
(B) The solution becomes more basic.
(C) The solution remains neutral.
(D) The solution becomes more acidic because HF is a weak acid.
(E) The solution becomes more basic because HF is a strong acid.

Chap 16
A D D A D
B C B B C
A D C A B

- (B) -1.2 kJ/mol
(C) 71 kJ/mol
(D) 671 kJ/mol

Cher 17

DCDCA

CB DAB

Clay 20

DCDCD

DABBB

CCAA